Science Fiction, Science Fact

There exists a magic weapon that terrifies enemies and is capable of unparalleled destruction. There is no known defense, nor effective countermeasure. This secret weapon, when deployed, causes mass destruction and terror – terror so great that the opposing military commander's best advice is to advise his troops to *get down on our elbows and knees, and beseech Our Lord to save us from this danger*[1]. Science fiction or science fact?

Science fact. This magic weapon was Greek Fire. It was a liquid that burst into flame on contact. Greek Fire (also called wildfire, liquid fire, or Byzantine fire) was a weapon used in the seventh century by the Byzantine Empire (also known as the Greek-speaking Roman Empire).

Greek Fire, supposedly invented by a Syrian Christian refugee named Callinicus, was a totally new type of defensive and offensive weapon. Water did not put it out – in fact, it would even burn underwater. The exact chemical composition of Greek Fire was a closely guarded military secret – so secret, in fact, that the exact formula has been lost to history[2]. We can, however, guess its composition. It probably contained chemicals such as naphtha, niter, sulfur, saltpeter, and phosphorus[3]. It is possible that it contained calcium phosphide, which would ignite upon contact with water.

The exact chemical formula, even though amazing, is not as amazing as the delivery system that the Byzantines used. They managed to shoot this liquid fire from swiveling nozzles mounted on small boats. This was accomplished without thermometers, safety valves, pressure gauges, or other modern technology. Boats drenched with Greek Fire burned – and sailors were unable to quench the fire if it landed on them. Once a soldier or sailor was hit with the liquid, even jumping into the sea would not extinguish the flames. The weapon caused enemies to shiver in terror and capitulate in despair. It has been compared with the modern dread of the atomic bomb.

Sounds like magic, right? That's the key – really successful technology appears like magic. I know this because I was brought up right. I grew up on a diet of truly great science fiction, from truly great authors, and Arthur C. Clarke was one of my favorites. See, I remember Clarke's three laws:

1. When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong[4].
2. The only way of discovering the limits of the possible is to venture a little way past them into the impossible.
3. Any sufficiently advanced technology is indistinguishable from magic[5].

I remember one of my magic moments. In 1981, I was working on my computer science degree at the University of Central Florida. Taking five computer science courses at the same time, I literally lived in the computer center. Large mainframe, limited computer time, crowded cardpunches, etc. Then I found some magic. Ever heard of the Commodore SuperPET, the world's first co-processor computer? It was a standard Commodore PET (with a 6502 processor), plus an expansion board that carried a 6809 processor and 64K more memory. The SuperPET ran versions of APL, FORTRAN, Pascal, and Basic. Although I had to put up my car to get the loan, I plunked down about $5,000 for one (including two 320K disk drives, a dot-matrix printer, and a blazing fast 300 baud modem). By contrast, a mainframe cost hundreds of thousands of dollars and needed a complex supporting infrastructure. My home computer truly was magic! While others waited for hours to punch cards, submit the card deck, and wait for a compile and run, I could sit at home and have UNLIMITED computer time.

Just a few years earlier, the thought of a home computer would have seemed as much like magic or science fiction as *Star Trek* or *Star Wars*. Fact is, it doesn't take long for science fiction magic to become commonplace. CDs. DVDs. HDTV. Hybrid cars. Cell phones. Bluetooth (I don't need a communicator – I just tap my ear, and tell my cell phone who I want to talk to). I wonder how much longer before *Star Trek* and *Star Wars* will look like fact instead of fiction.

Of course, nowadays, we are the ones who make the magic. The Stealth Fighter. The Airborne Laser. The Predator. The Active Denial System. The Space Shuttle. GPS. The Next Generation Destroyer. And almost every other program that the Department of Defense has under development. Science fiction yesterday. Science Fact tomorrow. It's all magic.

Let's hear it for the magic and the engineers who create it.

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Notes

1. See "Greek Fire, Poison Arrows and Scorpion Bombs," by Adrienne Mayor. This book is used throughout this this article. Also see <en.wipipedia.org/wiki/Greek_fire> and <www.greek.org/Romiosini/greek_fire.html>.
2. A legend, however, is that an angel whispered the formula to Emperor Constantine the Great.
3. See "A History of Greek Fire and Gunpowder," by J.R. Partington.
4. Clarke's Law, later the first of the three laws, was proposed by Arthur C. Clarke in the essay *Hazards of Prophecy: The Failure of Imagination*, in "Profiles of the Future." The second law is offered as a simple observation in the same essay; its status as Clarke's Second Law was conferred on it by others.
5. In a revised edition of "Profiles of the Future," Clarke acknowledged the Second Law and proposed the Third in order to round out the numbers, adding "As three laws were good enough for Newton, I have modestly decided to stop there." Out of those three laws, the Third Law is the most known and widely cited <en.wikipedia.org/wiki/Clarke's_three_laws> and <www.commodore.ca/products/pet/commodore_ pet.htm>.